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NOTES ON GEOPHILOIDEA FROM IOWA AND SOME NEIGHBOURING STATES.

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During several weeks in June and July of 1910 I had opportunity for making collections of chilopods in the district indicated by the title of this paper. Unfortunately, the season was unusually dry in these States, particularly in Michigan and Wisconsin, and, as a result, unfavourable for securing an abundance of material. The members of the Geophiloidea seemed especially difficult to uncover; but among the species obtained are several of exceptional interest, two representing new genera, for which it seems necessary to erect a new family. The families of the Geophiloidea now recognized as occurring in the United States, east of the Rocky Mts., may be separated as follows:

- a. Mandibles with a dentate lamella.
 - b. Mandibles with a single pectinate lamella; antennæ filiform or somewhat clavate..... Family *Schendylidæ*.
 - bb. Mandibles with several pectinate lamellæ; antennæ flattened, attenuated distad..... Family *Himantariidæ*.
- aa. Mandibles with no dentate lamella; with a single pectinate lamella.
 - b. Labrum fused for a short distance at middle; antennæ flattened, at least narrowly elliptic in cross-section, attenuated distad..... Family *Sogonidæ*.
 - bb. Labrum entirely free; antennæ cylindrical, filiform or a little clavate.
 - c. Median piece of labrum extending along and, at least in part, fused with the lateral; at middle of free edge with two much larger and more strongly-chitinized teeth directed more or less ventrad..... Family *Soniphilidæ*, fam. nov.
 - cc. Three divisions of labrum distinct; without two such larger and ventrally-directed teeth..... Family *Geophilidæ*.

Of these families, representatives of the Geophilidæ and Soniphilidæ alone were secured in the region covered by this paper. However, the Schendylidæ is represented, *Escaryus urbicus* (Meinert), having been taken in Minnesota, and the same species having been found by the writer to be quite common in New York State. The family Himantariidæ is represented in Texas and Mississippi by a species of Haplophilus, and by at least one of the genus Gosiphilus, *G. laticeps* (Wood). These genera may be found to range into the present section. The family Sogonidæ is at present known to be distributed in Texas (*Timpina texana* Chamberlin, a form with but five joints to the anal legs), and in South Carolina and Tennessee (*Sogona minima* Chamberlin). On the Pacific Coast occur several families not found east of the Rockies.

Family Geophilidæ.

Subfamily Geophiliræ.

Genus Geophilus Leach.

Geophilus rubens Say.

Syn. *Geophilus cephalicus* Wood.

Geophilus lævis Wood.

Geophilus okolonæ Bollman.

Localities.—DeWitt, Mongona and Boone, Iowa; Franklin Grove, Ill.; Saunder's, Mich.

This is a very common species in Indiana, Ohio and more Eastern States. The form described by Bollman from Arkansas agrees perfectly with this species, excepting that the number of pairs of legs is higher than usual in northern specimens. This, however, is in line with a tendency shown by many other species for the number of legs to show an increase in going from the north to the south or from high elevations to low. It is one of the commonest forms in this district. California specimens also frequently have a larger number of legs.

Genus Arenophilus Chamberlin.

Arenophilus bipuncticeps (Wood).

Syn. *Geophilus attenuatus* Bollman (but not certainly of Say).

Geophilus georgianus and *latro* Meinert.

Schendyla perforata McNeill.

Localities.—Mongona, Boone, DeWitt, Tama, Marshalltown, Iowa; Fremont, Neb.; Peoria, Ill.; Janesville, Wis.

This is by far the most abundant species. It ranges as a common form through the greater part of the United States in and east of the

Mississippi Valley. At Mongona (June 22), and Marshalltown (June 24), Iowa, and at Sterling, Ill. (June 26), females were taken with recently-laid eggs.

Genus *Pachymerium* Koch.

Pachymerium ferrugineum Koch.

Syn. *Geophilus foveatus* (McNeill).

Localities.—DeWitt, Iowa; Peoria, Ill.; Devil's Lake and Fond du Lac, Wisc.

At Fond du Lac (July 6), the species was found in great abundance among the stones at a river's edge, partly grown individuals being common, and a considerable number of females being found with bodies still coiled about their recently-hatched young.

This is a species widespread in the Eastern United States, as it is in Europe. The specimens secured are similar in size to Austrian specimens, most being under 25 mm. in length.

Subfamily Chilenophilinæ

Genus *Taiyuna* Chamberlin.

Taiyuna opita, sp. nov.

Proportionately robust; attenuated strongly caudad, and also decidedly but less strongly cephalad. Sparsely clothed throughout with long bristles.

Head with corners rounded; sides convexly curving; caudal margin straight; anterior margin extended forward from corners to middle, and a little incurved at median line; longer than wide in ratio, 19:16, and five times longer than exposed portion of basal plate. Prebasal plate absent. Basal plate overlapped in front by the cephalic, and behind by the first dorsal plate; free portion wider than median length in about ratio 34:7. Antennæ short; articles moderate and short, the ultimate equal in length to the two preceding taken together.

Claws of prehensorial feet when closed reaching the distal end of the first antennal article. Claw at base with a subcylindric, apically truncate, tooth; prefemur also with a strongly chitinated tooth at distal end; the intermediate joints also each with a distinct, conical and well-chitinated tooth. Prosternum unarmed; its anterior median margin nearly straight, not excised; chitinous lines not evident; suture parallel with margin; wider than long in ratio 39:35, longer than prefemur in ratio 7:4. Dorsum weakly bisulcate, also with a more median pair of fine sulci. Anterior præscuta short, being of moderate length in the middle region, and then

again shortening caudad. Spiracles all circular, the first greatly exceeding the second in size. First pair of legs much reduced; anterior pairs more robust than the caudal, not shorter. Anterior ventral plates with a rather weak median sulcus, most plates plane; pores not detected. Last ventral plate moderately wide; margins straight, the lateral moderately converging caudad. Coxopleuræ with about four pores in a row under edge of plate, and four or five free on the sides, well separated from each other. Anal legs longer and more crassate than the penult; without claws. Pairs of legs (in female) 41.

Length of female 15 mm.; width .9 mm.

Localities.—Posers and Kimball's, Mich.

Genus *Gnathomerium* Ribaut.

Gnathomerium umbraticum (McNeill).

Syn. *Gnathomerium americanum* Ribaut.

Locality.—Manitou, Colorado.

This seems to be a southern species, occurring widely and abundantly throughout the Southern States. In favourable seasons it may be found to be not rare in the present region, as Bollman reports it as common in Indiana.

Subfamily Linoteniniæ.

Genus *Linotenia* Koch.

Linotenia chionophila (Wood).

Localities.—Devil's Lake and Ashland, Wis.

Many specimens were taken at the former locality under leaves and stones about the margin of the lake. This species is boreal, being abundant, comparatively, in Alaska and adjacent islands. It was first described from specimens taken at Fort Simpson on the Red River of the North. It is very close to *Linotenia acuminata* (Leach) of Europe, and may have to be merged with it.

Linotenia fulva (Säger).

Localities.—Mongona, Boone, DeWitt and Marshalltown, Iowa; Franklin Grove, Ill.; Sterling, Ill.

Very much the commonest *Linotenia* in the Northern United States, and one of the commonest members of the entire order.

Family Soniphilidæ, fam. nov.

Genus *Soniphilus*, gen. nov.

Labrum free; the median part firmly fused to the lateral, at least at ends; edge of median portion directed ventrad and bearing a number of

very stout teeth, which extend directly ventrad (the figure accompanying suggests a bedding of these teeth somewhat caudad, which does not exist); of these teeth the two median are clearly largest, the others decreasing from median to outermost; lateral portions with edge bearing a few spinous processes much more weakly chitinized than the teeth of middle portion. (See pl. 1, fig. 3.) Mandibles with a single pectinate lamella; no dentate lamella. Both branches of first maxillæ set off by a suture; the outer branch biarticulate, entirely without lappets or with a single short, conical one on outer edge of base; coxæ completely fused at mesal line. Coxæ of second maxillæ fused at middle; palpi short, bearing a simple claw of normal size.

Chitinous lines of prosternum strongly developed. Prehensorial feet with joints all unarmed; claws when closed not attaining front margin of head. Frontal plate not discrete. Prebasal plate absent. At least the anterior sterna with caudal margin strongly chitinized in a sharp edge or blade-like form, which fits into a transverse groove in anterior margin of succeeding plate. (See fig. 5.) Pores not detected. Dorsal plates bisulcate. Last ventral plates very wide. Anal legs six-jointed, ending in claws.

Type.—*Soniphilus embius*, sp. nov.

Soniphilus secundus Chamb., a Californian species, also belongs here.

Soniphilus embius, sp. nov.

Slender, attenuated cephalad and caudad; body very sparsely provided with short straight hairs, the head with longer ones.

Yellowish-white, the anterior region more strongly yellow or lemon colored; head with prosternum and prehensorial feet pale reddish brown; antennæ yellowish white.

Head widest over caudal portion, the sides from middle caudad but very slightly converging, the sides in front of middle nearly straight and clearly converging; anterior margin with middle part straight, transverse, on each side a little oblique, extending a little caudad in running from middle to lateral cornea, straight. Frontal suture absent. Prebasal plate absent. Basal plate four times as wide as its median length, a little wider than cephalic plate (24:23). Antennæ filiform, of moderate length; articles longer than wide, decreasing in length distad to the penult, the ultimate about equal in length to the two preceding taken together.

Claws of prehensorial feet when closed not attaining the anterior margin of head, short, the inner free margin of prefemur very short or

almost obliterated; claw within a very small conical tooth at base, other articles unarmed. Prosternum with chitinous lines well developed; two submedian longitudinal sulci; anterior margin unarmed, weakly angularly depressed from sides to median line; much wider than long (14:9), longer than greatest length of prefemur nearly in ratio 9:5. Dorsum weakly bisulcate. Prescuta of middle region moderate or short, not much decreasing in length cephalad and caudad. Spiracles all circular, relatively large, the first considerably larger than the second, the others gradually decreasing from the second caudad. Legs of first pair decidedly shorter and more slender than the second. Ventral pores not detected. Plates of anterior portion of body with a transverse groove along cephalic edge, which is protected by a flange-like extension on the ventral side; into this groove fits the well-chitinized, extended blade-like caudal edge of the preceding plate in each case. Last ventral plate very wide, strongly narrowed caudad, the lateral margins a little incised below middle; caudal margin straight. Coxo-pleuræ each with a single free isolated pore of small size, and two larger pits covered by the edge of the plate. (See fig. 4.) Anal legs longer and slightly stouter than the penult (female). Pairs of legs (female) 43.

Length, 13 mm.

Localities.—DeWitt, Iowa.

The type is a single female, which was taken with her recently-laid eggs.

Genus *Poaphilus*, gen. nov.

Agreeing in general with *Soniphilus*, as described above, but readily distinguished in having the joints of the prehensorial feet dentate within and its claws extending much beyond the front margin of the head. The last ventral plate is narrow or but moderate in width, not very wide, as in the preceding genus.

Type.—*Poaphilus kewinus*, sp. nov.

Aside from the species here described, a second one from New Mexico is also known.

Poaphilus kewinus, sp. nov.

Body very small, strongly attenuated cephalad and caudad.

Antennæ and legs pale yellow; body light yellowish brown; head with prosternum and prehensorial feet light reddish brown.

Head much longer than wide (11:8); ten or eleven times as long as the very short basal plate; relatively narrow, leaving sides of prehensorial

feet exposed for entire length; caudal margin truncate, sides weakly bowed outward from end to end, the anterior margin rounded on each side, mesally incised. Frontal plate not discrete. Prebasal plate absent. Basal plate greatly abbreviated, the exposed portion eight times as wide as long.

Antennæ filiform, as compared with body length rather long; articles moderately long, decreasing distad, the ultimate a little longer than the two preceding together; bristles very long, distad, becoming shorter and denser as usual.

Claws of prehensorial feet when closed attaining distal end of first antennal article; claw armed at base with an acute conical tooth, prefemur with a low, conical and subdentiform protrusion on mesal surface, other joints unarmed. Prosternum wider than long in ratio 20:17; longer than the prefemur in the ratio 17:10, nearly; chitinous lines distinct. Dorsal plates bisulcate; also with a weak median sulcus. All prescuta short. All spiracles circular, the first larger than the second. First pair of legs shorter and much more slender than the second; anterior pairs shorter and thicker than those of posterior portion of body. Last ventral plate moderately wide, narrowed caudad, the margins nearly straight, the caudal slightly excised. Coxopleural pores four, small, two of these covered or partly covered by the edge of the last ventral plate and the other two free. Anal legs longer and thicker than the penult, ending in a long slender claw. Pairs of legs in female, 37.

Length, 6.5 mm.

Locality.—Marshalltown, Iowa.

The type, as with the preceding species, is a single female which was taken—her eggs were very few in number.

EXPLANATION OF PLATE.

Soniphilus embius, gen. et sp. nov.

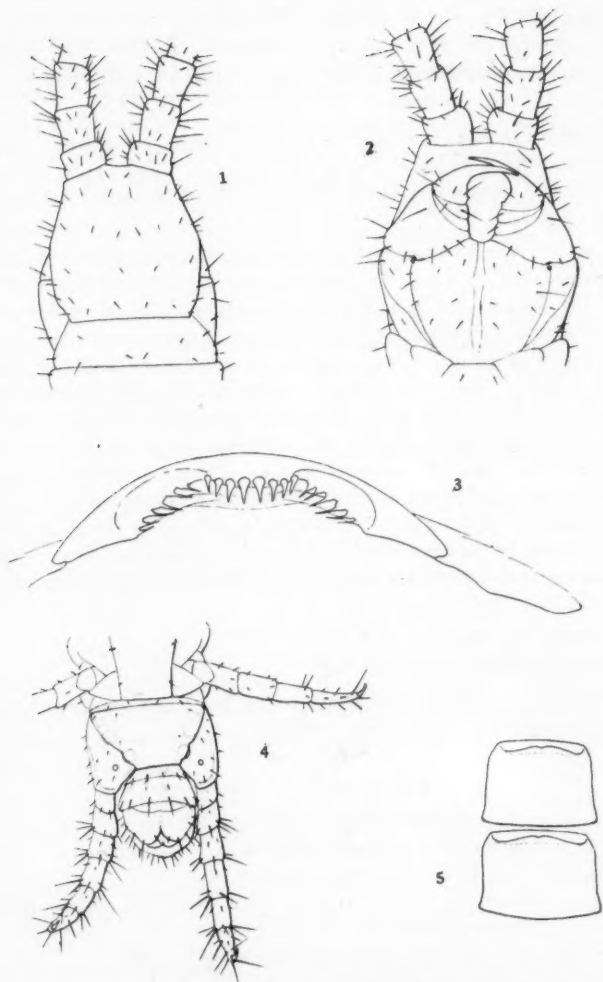
Fig. 1.—Dorsal view of anterior portion.

Fig. 2.—Ventral view of anterior portion.

Fig. 3.—Labrum, ventral aspect. (The teeth of median portion normally extend directly ventrad; the figure shows them extending caudo-ventrad, this resulting from depression by the cover-glass).

Fig. 4.—Ventral view of posterior portion.

Fig. 5.—Ninth and tenth ventral plates.



SONIPHILUS EMBIUS, GEN. ET SP. NOV.

THE LIGHT-EMISSION OF AMERICAN LAMPYRIDÆ: NOTES AND CORRECTIONS ON FORMER PAPERS.

BY F. ALEX. MCDERMOTT, WASHINGTON, D. C.

The author wishes to make the following corrections in and additions to his former papers on "The Light-Emission of American Lampyridæ" in this journal:

Vol. 42 (1910), p. 360.—Modify lines 13 to 9 from bottom to read:

"The *consanguineus* emits two such flashes, separated by an interval of about a second, followed by a longer interval before the next two; sometimes the double flash is followed by a residual phosphorescence, as in *pyralis*. The *angulata* usually emits a single flash, much shorter and more sudden than that of *pyralis*, being in this regard like that of *scintillans*, but more greenish in colour than the light of the latter insect." (The twinkling light ascribed to *angulata* was no doubt that of a male *Lecotea lucifera* Melsh., its somewhat larger and very similar relative.)

P. 363.—Delete note at foot of page, as this paper proved to have no bearing on the immediate subject.

Vol. 43 (1911), p. 404.—After line 4, *Photuris* has been observed mating only rarely; upon one occasion a pair of these insects were observed to meet when flying low in almost directly opposite directions, and to alight on the ground and couple; this occurred in a little patch of woods where there were very few other fireflies of any species near. Both were flashing rapidly as they flew toward each other.

P. 405, line 17 from bottom, after "p. 142."—Rennie (Insect Miscellanies, Lond., 1831, pp. 222-232) cites some observations on *Lampyris noctiluca*, which, however, are on the whole opposed to the theory of the sexual significance of the photogenicity.

Line 11 from bottom.—Olivier (Compt. Rend. Assn. Fr. Av. Sci., 1909, Sess. 37, pp. 573-580; 1er. Cong. Internat. d'Entomol., Brux., Aug., 1910, pp. 273-382), has also made some observations along the same line as Gorham.

Line 4 from bottom.—For "Avesbury" read "Avebury." (Sir John Lubbock.)

Rennie (supra) also notes the tendency of *Lampyris noctiluca* ♂ to fly into lighted rooms.

P. 406, line 8.—Before "light" insert "ordinary."

March, 1921

NOTES ON THE CHALCIDOID *TRICHAPORUS* FOERSTER
OF THE FAMILY EULOPHIDÆ, WITH DESCRIPTION
OF ONE NEW NORTH AMERICAN
FORM FROM ILLINOIS.

BY A. ARSENE GIRAULT, BRISBANE, AUSTRALIA.

(Continued from page 52.)

Family Eulophidæ.

Subfamily Tetrastichinæ.

Tribe Tetrastichini.

Trichaporus Foerster, novum Ashmead, 1904.

(Type: *Trichaporus melleus* Ashmead.)

1. *Trichaporus melleus* Ashmead.

Ashmead, 1904, p. 512.

"*Trichoporus melleus*, sp. nov.

"Female: Length, 1.8 mm. Honey yellow, punctate, the eyes brown, the abdomen with a blackish spot on each side near the middle, the scape and legs pale yellowish; flagellum long, filiform, hairy; wings hyaline, the veins pale yellowish. The abdomen is cylindrical, pointed at apex, and as long as the head and thorax united.

"Male: Length, 1.4 mm. Agrees in colour with the female except that the blackish spots near the middle of the abdomen unite and form a transverse band, while the veins in the front wings are brownish. The flagellum is long, and the hairs are much longer than in the female.

"Brazil: Santarem; Chapada."

Type in the Carnegie Museum, Pittsburgh, Pennsylvania.

2. *Trichaporus viridicyaneus* Ashmead.

Ashmead, 1904, p. 512.

"*Trichoporus viridicyaneus*, sp. nov.

"Female: Length, 2-2.6 mm. Metallic bluish green to blue, punctate; scape, trochanters, apices of all femora, and all tibiae and tarsi, except the last joint, pale yellowish; flagellum brownish yellow, pubescent; wings hyaline, the veins yellowish. The abdomen is long, cylindrical, twice as long as the thorax, pubescent, the first and second body segments about equal, shorter than the third, the first segment longer than the third, the sixth and seventh short, the seventh conical.

"Male: Length, 1.4-1.5 mm. Agrees well with the female, except in the usual sexual differences and in a slight difference in the colour of the antennæ and legs. The flagellum is darker, with longer hairs, and with only one ring joint, while the front and middle femora are dusky only

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at base. The abdomen is cylindrical, a little longer than the head and thorax united.

"Brazil: Chapada, in April. Fourteen females, six male specimens."

Types in the Carnegie Museum, Pittsburgh, Pennsylvania.

3. *Trichoporus persimilis* Ashmead.

Ashmead, 1904, p. 512.

"*Trichoporus persimilis*, sp. nov.

"Female: Length, 2.8 mm. Metallic brown-black, punctate, the abdomen brown beneath; flagellum brown, hairy; scape, pedicel and legs, including the coxæ, honey yellow, the femora more or less dusky or brownish, especially basally; otherwise it is very similar to *T. viridicyaneus* except that the first body segment of the abdomen is twice the length of the second.

"Brazil: Chapada, in April. Two specimens."

Types in the Carnegie Museum, Pittsburgh, Pennsylvania.

4. *Trichoporus æneoviridis*, species nova.

Normal position.

Female: Length, 1.8 mm. Average, moderate for the family.

General colour bright metallic green, with a brassy sheen, the scutellum with a purplish hue in certain lights. Legs pallid yellow, including the apices of the coxæ; tips of apical tarsal joints dusky; antennæ dark, indefinite in colour, the scape paler yellowish, the pedicel and ring-joint slightly paler; venation indefinite, dusky yellowish. Eyes and ocelli dark garnet, the latter moderately large, in a flat isosceles triangle on the vertex, the distance between each about the same as the distance between each lateral ocellus and the margin of the eye.

Head (cephalic aspect) bilobed, longer than wide (dorsal aspect), as wide as the greatest width of the thorax, five times wider than long (cephalo-caudad), squamosely reticulated, the cephalic ocellus at the extreme median apex of the vertex (cephalad), one-third wider across the eyes (cephalo-caudad) than at the median line of the vertex, which is narrowed. Eyes ovate, half the length of the genæ, their surface much rougher than that of the head. Antennæ inserted below (ventrad) the middle of the face, slightly above (dorsad) the ventral ends of the eyes. Genal sulcus broad, distinct.

Mesothorax, including axillæ, scutum, scutellum and parapsides, strongly shagreened, or squamosely reticulated, the pleura less so, polygonally sculptured; dorsum of the metathorax roughly reticulated, or punctate, the median carina moderately strong. Abdomen closely,

squamosely reticulated. Scutellum with four conspicuous longitudinal furrows, two on each side of the meson, the lateral ones barely visible from the direct dorsal aspect and at the lateral margin of the sclerite in the dorso-lateral aspect. Parapsidal furrows conspicuous, deep; mesoscutum with a slight carina along the median line. Abdomen ovate, the segments subequal, segment 2 longest, 3 shorter than 4, 5 and 6, widest at segment 4, and about equal in length to the head and thorax combined; caudal margins of the segments straight, or slightly concaved at the meson. Tarsi 4-jointed.

Fore wings hyaline, the marginal fringes short, the discal cilia uniform; postmarginal vein absent, the marginal vein about a fourth longer than the submarginal, the latter broken. Hind wings uniformly ciliate discally. Stigmal vein of fore wings moderate in length, clavate, and with an uncus.

Antennæ 9-jointed; scape about equal in length to the pedicel and first funicle joint combined, inserted not much below the middle of the face; pedicel subconic, over one-third shorter than funicle joint 1; ring-joint inconspicuous but evident; funicle joints 1 and 3 subequal, cylindrical oval, funicle 2 slightly longer, nearly twice the length of the pedicel; the three club joints decreasing in size, the basal joint longer than the pedicel, nearly a third shorter than funicle 3 and a fourth longer than joint 2 of the club; the apical joint conical, smaller than the pedicel, and ending in a short spine-like projection. Antennæ bearing stiff curved bristles, the flagellum longitudinally carinate. Ovipositor not exerted. Mandibles fuscous, tridentate, symmetrical, the outer and next tooth conspicuous, the inner or third tooth one-half shorter than the second, barely defined, its inner (nasal) margin obliquely concaved.

From 33 specimens, $\frac{2}{3}$ -inch objective, 1-inch optic, Bausch and Lomb.

Male.—Length 1.5 mm., smaller, more slender. The same. Abdomen cylindrical; antennæ slightly lighter in colour, more hairy, the setæ longer, 10-jointed, the same, but the funicle 4-jointed, the first joint distinctly smaller than the others, the ring-joint minute, subobsolete, and the two basal joints of the club subequal in length; funicle joints 2 and 3 equal, longer than 4. Mandibles the same.

From 4 specimens, the same magnification.

Described from four males, thirty-five females, reared in the insectary of the State Entomologist, Urbana, Illinois, May 27, 1908, from, supposedly, a single larva of *Malacosoma americana* (Harris) on apple twigs. On May 18 this supposed lasiocampid larva was dissected and found to

contain the pupæ of this species, which emerged as adults on the date mentioned. The host was one of several larvæ sent to the insectary, together with several incidental puparia of a species of *Syrphus*, all of them, with this single exception, being parasitized by a solitary Ichneumonoid. The nature of its parasitism is, therefore, unknown, the host being either a dipteran of the family Syrphidæ, a hymenopteran of the family Ichneumonidæ or the lasiocampid. It is apparently a primary parasite of the latter.

It differs from all other species in the genus in being comparatively smooth, the head, thorax and abdomen squamosely reticulated, not punctate, agreeing somewhat in this respect with *Syntomosphyrum*, Foerster.

Habitat.—Centralia, Illinois (L. M. Smith).

Type.—Accession No. 37,543, Illinois State Laboratory of Natural History, Urbana, Illinois, 3 females, tag-mounted, female antenna in xylol-balsam (1 slide). Cotype No. 12,200, United States National Museum, Washington, D. C., 2 females on tags.

5. *Trichaporus colliguayæ* (Philippi).

Exurus colliguayæ Philippi, 1873, pp. 296–298, taf. 1, figs. 1, 1a, 1c.

Exurus colliguayæ Philippi, de Dalla Torre, 1898, p. 159.

Trichaporus colliguaya (Philippi), Ashmead, 1904, p. 512.

“1. *Gallen des Colliguai*. Taf. 1, fig. 1a-e.

“Man sieht sehr häufig Gallen am untern Theil der Kätzchen des Colliguai, *Colliguaya odorifera* Molina, eines Strauches aus der Familie der Euphorbiaceen, der in den mittleren Provinzen Chile's gemein ist, und dessen Holz beim Brennen angenehm riecht. Fig. 1 zeigt eine solche Galle in natürlicher Grösse. Die unteren zwei Drittel der Axe des Kätzchens sind gewaltig aufgetrieben, im Gestalt einer länglich eiförmigen, etwas unregelmässigen Knolle, und tragen auf ihrer Oberfläche noch die schuppenartigen Deckblätter, auf denen die Staubgefässe entspringen, welche mehr oder weniger vollständig entwickelt sind. Schneidet man die Galle durch, so sieht man im Innern derselben eine unregelmässige, von 2–3 mill. dicken Wänden eingeschlossene Höhle, in welcher zahlreiche Maden sitzen. Im Anfang sind die Gallen gelbgrün, später mehr roth, zuletzt, wenn sie beginnen trocken zu werden, braun. Sie sind von mässiger Consistenz, und milchen beim Durchschneiden weniger als die übrigen Theile der Pflanze. Die Maden zeigen nichts Auffallendes; man sieht deutlich mit dem Kopf dreizehn Ringe; sie zeigen keine Spur von Füssen und Augen, etc. Ich sammelte eine Menge dieser Gallen, und

that sie in ein grosses Einmacheglas, um zu sehen, was sich daraus entwickeln würde, vergass aber über andern Geschäften meine Gallen, bis ich nach längerer Zeit in dem Glase viele hundert kleine Pteromalinen, so wie ein Paar grössere einer zweiten Art, aber kein einziges Exemplar einer Gallwespe oder Fliege fand. Ich muss daher glauben, dass die erst erwähnte Pteromaline die Gallen hervorbringt, und die zweite im Larvenzustand die Maden der ersten auffrisst.

“Die Gallen bildende Pteromaline scheint mir ein besonderes Genus bilden zu müssen, und ich habe sie *Exurus Colliguaya* genannt (ἔξουρος “was einen Schwanz bildet, spitz zulauft). Der Körper ist 3 mill. lang, die Flügelgespannung beträgt 7 mill. Das vollkommene Insekt ist ganz schwarz und glänzend, bis auf die untere Hälfte der Schenkel, die Schienen und Tarsen, welche schalgelb sind. Der Kopf ist quer; seine drei Punktaugen liegen in einer graden Linie zwischen* den Netzaugen, wie man deutlich an der Puppe wahrnimmt, da deren Körper heller gefärbt ist; am vollkommenen Insekt sind sie schwer zu sehen. Die Fühler entspringen in der Höhe des untern Augenrandes, sind gekniet und nur so lang, das sie, zürückgeschlagen, bis etwas über den Ursprung der Flügel reichen würden, und sind nach dem Geschlecht verschieden, beim Männchen nämlich federbuschartig lang behaart und siebengliedrig, beim Weibchen sehr kurz behaart und sechsgliedrig. Das erste Glied ist keulenförmig und ziemlich dick; es reicht bis an den Scheitel und ist auf der Oberseite schwach behaart, sonst kahl; das zweite Glied ist verkehrt kegelförmig und etwa ein Drittel so lang; das dritte Glied ist beim Männchen an der Basis verdickt, zwei Drittel so lang wie das erste, und ähnlich ist das vierte, fünfte und sechste, nur nimmt ihre Dicke allmählich ab; das siebente ist etwas länger als das vorhergehende, im ganzen walzenförmig, in der Mitte etwas dicker. Das dritte, vierte, fünfte, sechste Glied haben am Grunde einen Wirtel längerer Haare, das siebente ist überall gleichmässig und ziemlich lang behaart. Beim Weibchen sind die beiden ersten Glieder der Fühler ziemlich wie beim Mäunchen, aber alle folgenden sind walzenförmig und überall gleichmassig behaart; das dritte Glied scheint aus der Verschmelzung von zwei Gliedern entstanden zu sein. Mundtheile habe ich am vollkommenen Insekt nicht bemerkt, obgleich ich an der Puppe an der Stelle zwei braune Punkte gesehen habe, die ich für die Mandibeln halten möchte.

“Der Hinterleib ist nicht gestielt, verlängert, allmählich zugespitzt, und ist die Spitze beim Weibchen länger; er ist auf der Bauchseite gekielt

*Beginning p. 297.

auf dem Rücken (wenigstens bei trocknen Exemplaren) concav, mit anliegenden, kurzen Härchen bekleidet, aber doch sehr glänzend, so dass man nur schwer erkennen kann, dass er aus sieben Gliedern besteht; an der Puppe ist dies leichter. Die Brust ist fast ganz kahl; der Rücken der Vorderbrust ist klein, kaum so lang wie der Kopf; die Mittelbrust ist ziemlich gross; das Schildchen deutlich, sonst durch nichts ausgezeichnet; die Hinterbrust sanft abschussig. Die Vorderflügel sind dadurch ausgezeichnet, dass der erste und einzige Nerv den Vorderrand selbst bildet bis zu zwei Dritteln der Länge, wo er einen stielförmigen Ast nach hinten und aussen schickt. Die Hinterflügel haben an der Basis keinen Lappen. Die Beine sind lang und schlank, durch nichts Besonderes ausgezeichnet. Die Hüfte ist ziemlich dick; es sind zwei kleine Trochanter vorhanden; der Schenkel ist schlank, in der Mitte mässig verdickt, schwach und kurz behaart; die Schiene ist ziemlich walzenförmig,† und trägt am Ende einen kurzen Dorn. Die Tarsen sind kurzen als die Schienen, bedeutend dünner, walzenförmig; die einzelnen Glieder sind schwer zu unterscheiden; es sind ihrer fünf; das erste Glied ist das längste, das vierte und fünfte sind zusammen kaum länger als das dritte. Sehr lang sind die beiden Haftenlappen, fast länger als das fünfte Glied, während die Klauen sehr klein sind, nämlich kaum halb so lang wie das fünfte Glied dick ist.

"Da ich mich sehr wenig mit dem Studium der Hymenopteren, namentlich der kleineren, beschäftigt habe, so muss ich es anderen Entomologen überlassen, zu entscheiden, welches die genauere Stellung dieses Insektes im System ist; in den wenigen, einschlägigen Büchern, die mir zu Gebote stehen, habe ich, wie gesagt, kein Genus finden können, in welches ich dasselbe hätte einordnen können.

"In der Abbildung auf Taf. 1 ist fig. 1d eine Galle, von aussen gesehen; fig. 1e dieselbe aufgeschnitten; 1 das weibliche Insekt, vergrössert; die darunter stehenden Linien geben die Grösse an; 1a ist ein stark vergrösserter Fühler des Männchens, 1b des Weibchens, 1c der Tarsus." Pp. 296-298.

The form of this species, as shown in the figure, is similar in general to that of *Trichaporus*, but the tarsi are 5-jointed, the antenna 6-jointed in the female, the scutellum small and apparently without grooves, the parapsidal furrows apparently absent, the body not punctate, and other characters, which make its present position questionable. I think, however, that Ashmead has placed it as well as circumstances allow. I

†Beginning p. 298.

do not know of existing specimens, but there are probably some in the Naturhistorische Museum, St. Yago, Chile.

6. *Trichoporus columbianus* (Ashmead).

Euderus columbiana Ashmead, 1888, pp. 104-105.

Euderus columbianus Ashmead, de Dalla Torre, 1888, p. 6.

Trichoporus columbianus Ashmead, 1900, p. 561.

"*Euderus* Haliday.

"(14) *Euderus columbiana*, n. sp.

"♀. Length, 10 inch. Dull brown, or bronzy-green, its whole surface, including the abdomen, strongly, confluent punctate. Head transverse, not wider than the posterior part of the mesothorax, and with only a slight antennal groove in front. Antennæ about as long as the thorax, ‡ eight-jointed; scape slender, yellowish brown; flagellum dark brown, about twice as long as the scape, pubescent, the pedicel shorter than the funicle joint, the latter joint the longest, about twice as long as wide, the following joints being not much longer than wide, sub-moniliform. Thorax: collar transverse, rounded before; mesothorax with parapsidal grooves well defined; scutellum longer than wide, without grooves, rounded behind, sides parallel. Abdomen conic-ovate, cylindric, one-third longer than head and thorax together, the segments of nearly equal length. Legs dark brown, trochanters, knees, fore and middle tibiæ, and all the tarsi honey-yellow, hind tibiæ dusky in the middle. Wings hyaline, fringed with short ciliæ; the veins brown, the marginal is twice the length of the submarginal, the stigmal short, while the postmarginal is wanting.

"Hab.—Florida and District of Columbia."

I have been unable to connect, directly, *Euderus columbianus* Ashmead with *Trichoporus columbianus* Ashmead listed in Smith's (1900) Catalogue of the Insects of New Jersey, but as I cannot, in addition, find the original description of the latter, conclude that they are synonymic and that Ashmead intended the former species.

In characters, the species does not agree with either genus (*Euderus* Haliday or *Trichoporus*), as now limited (but does with the definition of Foerster, 1856), and can hardly belong to the Tetrastichini as limited by Ashmead (1904), the scutellum having no grooves. From the description of the species quoted in foregoing, being an eulophid with a long marginal vein, short submarginal and stigmal veins, without a postmarginal vein and grooves on the scutellum, with 8-jointed antennæ and complete parapsidal

‡Ending p. 104.

furrows (implied) sessile abdomen, the species falls near the omphalinine genus, *Closterocerus* Westwood. As I have not seen the species, however, I think that Ashmead's later determination should be accepted for the present, and so I have included it here.*

Smith (1900), gives the following note concerning this species: "Lives in Cecidomyid galls, widely distributed (Ashm.)." The species occurs in Florida, District of Columbia and New Jersey.

The types are probably in the United States National Museum, Washington, D. C.

Table of Species.

This table is constructed from the literature, and caution should therefore be exercised in identifying species by its aid alone. It forms merely an index to the species included within the group.

Females.

- A. Species metallic bronze-greenish to bluish or brownish.*
 - a. Dull brown or bronzy-green, confluent punctate.*
Flagellum dark brown; scutellum without grooves; legs dark brown and honey-yellow *columbianus* (Ashmead).
 - b. Metallic brown-black.*
Flagellum brown; scutellum with grooves; legs and coxæ honey-yellow, with some brownish on femora . . . *persimilis* Ashmead.
 - c. Metallic blue-green, punctate.*
Flagellum brown-yellow; scutellum with grooves; tibiae and tarsi pallid yellow, femora and coxæ green *viridicyaneus* Ashmead.
 - d. Metallic, shining, bright green, brassy, squamously reticulated.*
Flagellum dusky, neutral; scutellum with four grooved lines; legs uniformly pallid yellow, the coxæ metallic green *æneoviridis* Girault.
- B. Species shining black.*
 - a. Flagellum black; legs yellow and black; scutellum without grooves colliguayæ* (Philippi).
- C. Species honey-yellow.*
 - a. Flagellum yellow; punctate; legs pallid yellow. melleus* Ashmead.
- D. Species bright metallic green, brassy; squamously reticulated.*
 - a. Metathorax punctate; scutellum with four grooved lines; legs*

*It may be that *Trichaporus* Foerster, with Ashmead's *columbianus* as type, could be resurrected, while the group of Ashmeadian species now forming the genus, as here proposed, including the new species, could be renamed.

pallid yellow, the coxæ metallic green; flagellum dusky, the scape and pedicel paler.....*ancoviridis* Girault.

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1856. Foerster, Arnold.—Hymenopterologische Studien, Aachen, II, pp. 83, 84, 85.
1866. Taschenberg, E. L.—Die Hymenopteren Deutschlands nach ihren Gattungen und theilweise nach ihren Arten als Wegweiser für angehende Hymenopterologen, etc. Leipzig, p. 109.
- Trichaporus* Foerster.—Date of publication not given; preface dated August, 1865, Halle.
1867. Kirchner, Leopold.—Catalogus hymenopterorum europæ, Vindobonæ, p. 186, No. 700.
- “700.—G. *Trichaporus* Förster, Hym. Stud. II 85. 1, Tr. Sp.?”
1872. Walker, Francis.—Notes on Chalcidæ, London, Part VI, pp. 104-105.
- Translation of Foerster (1856).
1873. Philippi, Rudolph Amandus.—Chilenische Insekten beschrieben von Dr. R. A. Philippi. (Stettinger) Entomologischer Zeitung. (Herausgegeben von dem entomologischen Vereine zu Stettin), Stettin, XXXIV, pp. 296-298, Taf. I, figs. 1, 1a-1e.
1888. Ashmead, William Harris.—Descriptions of some new North American Chalcididæ. CAN. ENT., London, Ontario, XX, pp. 104-105.
1898. De Dalla Torre, Carl G.—Catalogus Hymenopterorum hujusque descriptorum systematicus et synonymicus, Lipsiæ, V, pp. 27, 159.
1900. Ashmead, William Harris, in John Bernhard Smith.—Insects of New Jersey. A list of species occurring in New Jersey, etc. Supplement, 27th Annual Rep. State Board of Agr., Trenton, p. 561.
- Trichaporus columbianus* Ashmead.
1900. Smith, John Bernhard.—Vide Ashmead, 1900.
1904. Ashmead, William Harris.—Classification of the Chalcid flies or the superfamily Chalcidoidea, with descriptions of new species, etc. Memoirs of the Carnegie Museum, Pittsburgh, Pennsylvania, I, No. 4 (Publications of the Carnegie Museum, Serial No. 21), pp. 348-350, 392, 512.
1907. Scheniedéknecht, Otto.—Die Hymenopteren Mitteleuropas, etc., Jena, pp. 489, 490.
- Same as Ashmead (1904); table of genera.

1909. Idem.—Genera Insectorum (dirigé par P. Wytman), Bruxelles, 97 me fascicule, Family Chalcididae. pp. 427, 464, 465, 468.

Table to the genus as in Ashmead (1904); brief diagnosis of the genus, listing *colliguayæ*, *melleus*, *persimilis* and *viridicyaneus*, *Euderus columbianus* (p. 427).

(See also Kieffer, bionomic note on *colliguayæ*, Révista Chilena de Historia Natural. Organo del Museo de Valparaiso, VII, p. 111.)

NEW AFRICAN TIPULIDÆ.

BY C. P. ALEXANDER, ITHACA, N. Y.

The following species were given by Mr. Chas. W. Howard to Prof. Needham, and later turned over to me for examination. There were four specimens, representing three species, of which two are herein characterized as new. Mr. Howard's remark, that "the species were as thick as gnats," is interesting.

Styringomyia howardi, n. sp.

Holotype.—♂, brown and gray; length, 5.25 mm.; width, 4.75 mm.

Mouthparts dark brownish black; palpi, first segment very short; second segment large, oval, brown, apical third black; third more slender, brown, apical two-thirds black; terminal segment about as thick as the penultimate. Antennæ: first segment elongated, gray; second oval, enlarged at the distal end, remaining segments oval, gradually becoming more elongated to the tip; segments with a short pubescence and long irregular hairs, which are scarcely verticillate; first segment gray, second dark brown at tip, yellowish at base; remaining segments pale brownish yellow, the hairs darker; ommatidia large, coarse, black; front, vertex, genæ and occiput gray, with stout, scattered black bristles.

Pronotum large and prominent, showing an unusually generalized condition; the scutellum U-shaped, encircling the cephalic margin of the mesothoracic præscutum, with about three prominent bristles on the lateral margin; the scutum is narrower, running to an obtuse point cephalad, with a group of bristles along the lateral margin. Mesonotum: præscutum with a row of bristles along each side of the median line and a row along the lateral margin, this row incurving near the cephalic margin of the sclerite; scutum with four bristles on each half; the scutellum with a bristle on either side of the median line; postscutum and metanotum unarmed. Pronotum brown, pale apically, with an inverted U-shaped pale mark on the scutum; mesonotum præscutum, middle line pale, remainder

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brown; scutum grayish brown, yellow along the cephalic margin passing around the black bristle; scutellum yellow medially, brown laterad of the bristle, postscutum brown; metanotum brown; sterna yellow; epimera and episterna reddish brown, forming a narrow longitudinal band.

Halteres pale brown, subapically darker brown; tip yellow. Legs short and stout, thickly covered with appressed hairs; coxæ short, cylindrical, in the fore leg about as long as the trochanter; in the middle leg shorter than the prominent trochanter; in the hind leg prominent, much exceeding the shorter and narrower trochanter. Femora rather short, slender proximally, soon thickening so as to become almost clavate distally; the fore femora have stout, long hairs, which are scattered irregularly amongst the appressed hairs, becoming very numerous near the apical portion of the lower surface of the segment. Tibiæ slender throughout, tibiæ and metatarsi with a few prominent hairs regularly disposed; the other tarsal segments with a single hair at the tip. The fore femora are as long as the succeeding segments combined; the hind legs are longer than the others. Fore legs lacking (in the holotype); middle leg, coxæ and trochanter light yellow; femora yellow, with a medial and subapical brown band; tibiæ yellow, with a dark band before the middle and at the tip; tarsi yellow-tipped with dark brown; fifth segment and claws dark brown. Hind legs, coxæ, trochanters and femora as in the fore leg; tibiæ and tarsi yellow, excepting the last tarsal segment, which is darker.

Abdomen with numerous scattered hairs, yellow; the apical margins of the segments brown.

Wings with a faint yellow tinge; costal border and radial veins yellow; remaining veins darker; a dark suffusion around cross-vein $r-m$, at the union of M_3 with M_{1+2} and along the basal deflection of Cu_1 . Venation (see fig. 2): S_0 short, approximated with R basally; its tip opposite the origin of R_2 ; R short, the tip of R_1 before the middle of the



FIG. 2.—*Styringomyia howardi*, holotype.

wing, the sector originating a short distance back from the tip; R_8 straight, rather long; R_{2+3} very short, oblique; deflection of R_{4+5} very short, scarcely equal to the $r-m$ cross-vein; R_{4+5} long. M forks anterior to the

fork of R_2 ; deflection of M_{1+2} rather long; M_3 in a line with M , strongly deflected cephalad toward M_{1+2} , neatly, if not quite, obliterating the cross-vein m . Basal deflection of Cu_1 under the middle of cell 1st M_2 . First anal fused with Cu at extreme base; 2nd anal strongly curved at tip with a spur at the curve, which may be a remnant of a forked anal.

Paratype.—♂. This specimen is much darker than the type; the first six antennal segments are dark, remainder yellowish; thoracic dorsum dark brown, where it is light brown in the type; yellow of abdomen replaced by dark brownish gray, etc. This is but an extreme in colour.

This species is remarkably similar to the species mentioned by Osten Sacken (Mon. Dipt. N. Am., IV, p. 102, 103). The main differences are in the venation, the elongated cell 1st M_2 and incurved second anal with a spur at the curve being peculiar to *S. howardi*.

Holotype.—♂, Queliniani, Zambesi R., Dec. 20, '08; coll. Mr. C. W. Howard.

Paratype.—♂, with the type.

The only species described from Africa is *S. cornigera* Speiser (Dipt. aus Deutschland Afrikanischen Kolonien, p. 130-132, fig. 1*). This insect differs so remarkably from the remaining species of the genus, which otherwise form a homogenous compact group, that I propose to set it off in a new subgenus.

Neostyringomyia, subgen. n.

Char.—Radius long, its tip beyond the middle of the wing; R_2 remarkably shortened, no longer than the $r-m$ cross-vein; R_{2+3} sinuate, leaving cell R_1 very different in shape from that which obtains in the subgenus *Styringomyia*; cross-vein m long and prominent; basal fusion of Cu and 1st A very long; prothorax narrow, scarcely one-fourth as wide as the head; above the antennæ a short, bent spatulate horn.

Type.—*S. cornigera*, Speis.

Cornigera is obviously of more recent derivation than the members of the subgenus *Styringomyia*, and its venation is almost normal; the retreat of R_{2+3} toward the base of the wing may give a hint to the manner in which the remarkable venation of *Toxorhina* came about, perhaps by the fusion of R_{2+3} with some other vein, such as R_1 .

A species was described from the Pacific Islands by Grimshaw in 1901, as *S. didyma* (Fauna hawaiiensis, Vol. 3, pt. 1 (Dipt.), pl. 1, figs. 14-16), from Honolulu, Oahu De Meijere, in his recent paper, "Studien

*Berl. Ent. Zeitschr., 52 (1907).

uber Süd-ostasiat. Dipteren, V,"† records the species from much farther west (Batavia, Java, etc.). *Styringomyia didyma* belongs to the typical subgenus, and is extremely similar to the fossil species described by Löew** and Osten Sacken, as well as to the species under consideration. All of the species of the subgenus *Styringomyia*, as here limited, are very similar to one another in venation, and the coloration is inclined to be variable. *S. didyma* differs from the new species as follows: The wings are shorter in *didyma*; R_{4+5} is in a direct line with R_m , whereas there is a deflection at the origin of R_{4+5} in *S. howardi*. *Didyma* has no spur at the curve of 2nd anal. The coloration of the thorax of the two species is different. The male genitalia of the species have not been studied critically, and must furnish the ultimate criterion. It is, of course, possible that when further collections are made, intermediate stations for the genus will be discovered, and then it may be proved that *S. howardi* is merely a variant of *S. didyma*. However, I prefer to describe it as distinct at present.

In the end of Vol. III of the Monograph, p. VII, Osten Sacken came forward with the surprising intelligence that the genus *Styringomyia* still existed. He says: "During my passage through Stockholm in 1872, I made the interesting discovery that the genus, besides its occurrence in amber and copal, is found living in Africa. I saw several specimens among the unnamed Diptera from Caffraria (from Wahlberg's voyage) in the Stockholm Museum. The species was apparently different from that included in the copal, which I possess." Later, in "Studies on Tipulidæ,"* he states, "This singular genus, originally described from specimens included in copal from Zanzibar, and also in amber, has been discovered since as still living in South Africa. In the museum in Stockholm I have seen recent specimens brought from Caffraria by Wahlberg."

Despite Prof. Speiser's statement (i.e., p. 132), that Osten Sacken probably referred to *Elephantomyia wahlbergi* Bergr., when he made the last-quoted statement, I have no doubt but that Osten Sacken saw specimens of a true *Styringomyia* in Stockholm; an error of this calibre was not customary with Osten Sacken.

Mongoma zambesiæ, n. sp.

Holotype.—♀, brown; length, 5.75 mm.; width, 5.5 mm.

Rostrum and palpi dark brown; antennæ, first two segments dark

†Tijdschr. voor Entomol., April, 1911, p. 40.

**Löew, H. Dipteren Beiträge, I, p. 7, with f. (1847).

*Berl. Ent. Zeitschr., Bd. XXXI, 1887; Heft., II, pp. 185, 186.

brown, third light brown, remainder lacking. Front, vertex, genæ and occiput dark brown.

Thorax: Mesothoracic præscutum strongly produced cephalad, entirely covering the pronotum; cervical sclerite elongated, prominent; transverse suture scarcely V-shaped; mesothoracic præscutum, dark brown anteriorly, posteriorly with a pale brown median line, which extends back across the scutum, remainder of thoracic dorsum dark brown. Sterna, episterna and epimera brownish yellow; halteres pale; legs long, dull brown, at the joints somewhat darker; no processes on the fore femora, as described for *M. fragillima* and *M. curtipennis*.

Abdomen uniform brown.

Wings hyaline, costal margin yellow, stigma rather indistinct. Venation (see fig. 3), Sc very long, as in all members of the genus; R long, cross-vein *r* near its tip. R₂ gently arcuated, forking far before the tip

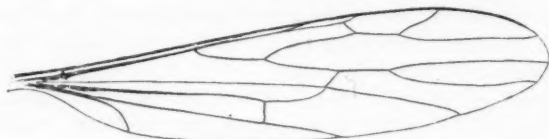


FIG 3.—*Mangonia zambezia*, holotype.

of Sc₁ and in a line with R₄₊₅; the cross-vein *r* far before the fork of R₂₊₃; R₂ short, oblique; R₃ long, in a line with R₂₊₃. R₄₊₅ fusing with M₁₊₂ to form the proximo-anterior border of cell M₂, thus obliterating the *r-m* cross-vein. M forks at the lower corner of cell M₂, M₁₊₂ departing cephalad, fusing with R₄₊₅ for a distance and finally separating, free at the margin; M₃ in a line with M. Cu short, its fork far back, the free position of Cu₁ very long, fusing with M₃ at the fork of M, and continuing to the margin so fused. Cu₂ fuses with 1st A far back from the wing-margin, so that 1st A + Cu₂ is over twice the length of the free portion of Cu₂ alone. 2nd A is very short, suggesting the condition found in *Petaurista*.

Holotype.—♀, Queliniani, Zambesi R., Dec. 20, '08; Mr. C. W. Howard.

The genus *Mongoma*, of which ten species have been described, has a world-wide distribution in the tropics; two species have been described from the West Indies, five species from the East Indies and Australia, and three species from Africa. The genus is distinguished by the excessive length of Sc, the obliteration of the *radio-medial* cross-vein by the long

fusion of R_{4+5} with M_{1+2} , and the decided tendency of Cu_2 to fuse with 1st A.

The West Indian species (*manca* and *pallida* Will., Dipt. St. Vincent, p. 291-293, figs. 6, 7, of *pallida*) and possibly *M. albitarsia* Dol. (E. Ind.), also, which I have not seen, are the most generalized members of the genus, in that Cu_2 and 1st A are distinct to the wing-margin. The intermediate group, containing *trentepohlii* Wied. (see Wiedemann, Aussereur. Zweifl. Insekt., I, 551; 18, tab. VIb, fig. 12; a better figure in De Meijere, Tijds. voor Ent., 1911, pl. IV, fig. 42), *fragillima* Westw. (see Westwood, Trans. Ent. Soc. Lond., 1881, pl. 17, fig. 1; also Needham, 23rd Rept., N. Y. St. Ent., pl. 21, fig. 6), and *exornata* Berg. (Bergr., Entomol. Tidskrift, 1888, opp. p. 130, fig. 3), has Cu_2 fused with 1st A for a short distance back from the tip (Cu_2 + 1st A less than one-half Cu_2). A third stage in the specialization of this part occurs in *M. pennijes* O. S. (E. Ind.). (See De Meijere, l.c., pl. IV, fig. 39.) The maximum of specialization, as far as I know, occurs in the present species, where the fusion of Cu_2 with 1st A is notable, and suggests the condition obtained in the families *Empididae* and *Dolichopodidae*.

Of the three described African species, *M. zambesia*, comes closest, apparently, to *exornata*. *M. fragillima* (and probably *M. curtipennis* also, according to Speiser, who compares it with *fragillima*), has vein M_2 separating from Cu_1 , and continuing distinct to the wing-margin; both of these species possess a curious spur-like structure at the base of the fore femora, which does not occur in *M. zambesia*.

I have a ♂ of *M. exornata* Bergr., taken at Queliniani, Zambesi R., Dec. 20, '08, in which the fore legs are lacking, and I am unable to state whether or not this structure occurs there. *M. exornata* has been recorded from Delagoa Bay, Portuguese East Africa; Caffraria, E. Cape Colony, and Amani, German E. Africa. It is apparently widely distributed throughout Eastern Africa.

ON THE OCCURRENCE OF A EUROPEAN SPECIES OF MYMARIDÆ IN NORTH AMERICA.

BY A. ARSENE GIRAULT, BRISBANE, AUSTRALIA.

Up to the present I have been successful in finding but a single species of the family Mymaridæ, common to Europe and North America. This species is *Anaphes pratensis* Foerster, which I have captured in Illinois, and of whose characteristics I write of in a paper on Chalcidoidea, to be published soon in Germany; the species is recorded from America

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in another paper, to appear in the Journal of the New York Entomological Society. The identification of the species is based on comparison with specimens found in the collections of the United States Museum, labelled as from France, the specific label in the handwriting of Ashmead. The evidence of the establishment of the identification is but presumptive, yet even if wrong, it is still true that we have specimens of a species common to both continents, whatever the name of the species may be. Only the specimens in the National Museum bear witness that it is *pratensis*, and their origin is not known. Nevertheless, Ashmead must have had good reason for so labelling them. For the present, identification must hold.

As I state elsewhere, the species is allied to both *iole* Girault and *nigrellus* Girault, and in this statement the species *hercules* Girault should have been included also; these are all American forms. From both *nigrellus* and *hercules* Foerster's species may be distinguished readily by reason of the fact that the marginal cilia of the fore wing at apex are distinctly longer (by over a third, they are about two-thirds the greatest width of the fore wings). There are a number of minute discal cilia scattered under the venation of the posterior wing, the fore wings are less regularly and uniformly fumated, and the proximal tarsal joints of all legs are longer. Its other characteristics, as compared with those of the American species mentioned above, are given in the papers referred to in this connection. The posterior wing bears two lines of discal cilia along each edge, the inner line of the two out some distance from the edge, toward the mid-longitudinal line of the blade.

In addition to the specimen of *pratensis*, recorded elsewhere, as having been captured in Illinois, I have since seen the following specimens, kindly sent to me by Mr. H. L. Viereck, and belonging to the Connecticut Agricultural College: Two slides bearing respectively a single male and female specimen (one pair in all), and each the label, "New Haven, Ct., 10 May, 1904. H. L. Viereck, *Taraxacum officinale*." In the United States the species occurs in Illinois (Urbana), and Connecticut (New Haven). The Connecticut specimens have been returned to Mr. Viereck.

While on this topic, it is meet to mention the possible identities of several other American forms with those of Europe. A species recently described as *Gonatocerus brunneus* Girault may possibly be *Gonatocerus flavus* Walker (so called), and my (*Stephanodes*) *Polynema psecas* is very similar, and possibly identical with *Polynema enockii* (Girault), a species which Enock described as *Stephanodes elegans* (*Stephanodes* equals *Polynema*; *elegans* preoccupied in *Polynema*). I have considered them distinct, however, as they seem so. Still they must be considered but questionably valid until a better opportunity is afforded for comparing them.

NEW SPECIES AND GENERA OF NORTH AMERICAN
LEPIDOPTERA.

BY WM. BARNES, M.D., AND J. H. MCDUNNOUGH, PH.D., DECATUR, ILL.

(Continued from page 57.)

Amolita delicata, sp. nov.

♂.—Head, thorax and abdomen pale gray; primaries very pale ochreous, suffused in the basal half and along costa with grayish, and finely sprinkled with black scales; faint traces of an oblique ochreous dash from apex to end of cell, caused by a lack of black scaling at this point; two minute black points may or may not be present at end of cell, close together; veins more or less marked with ochreous; fringes concolorous; secondaries slightly smoky, with traces of a dark terminal line and a smoky line cutting the white fringes.

♀.—Very similar to the ♂; the oblique apical dash better defined, due to darker marginal shading on both sides; frequently traces of a dark shade in the cell; veins light ochreous, giving a distinct strigate appearance to outer area of wing; secondaries pure white, with slight sprinkling of dark scales along costa and outer margin; fringes white with dark basal line. Beneath primaries of ♂ smoky, secondaries whitish, sprinkled with smoky especially along costa, and with faint discal dot; in ♀ primaries are much lighter than in ♂ and the discal dot of secondaries is wanting. Expanse, ♂, 25 mm.; ♀, 29 mm.

Habitat: White Mts., Ariz., 9 ♂s, 7 ♀s. Types, collection Barnes.

Vein 8 of secondaries arises from about the middle of the cell and not from the base as in Hampson's definition of the genus *Amolita*. As, however, this is also the case with *roseola* Sm., which is retained in the genus, we place it here rather than in *Doerriessa* Staud., in which it would fall according to Hampson's tables. The ♂ antennæ are laminate. The species varies somewhat as regards the black sprinkling, several specimens being almost uniformly pale ochreous, whilst others are distinctly sprinkled, with the veins showing clearly.

Amolita fratercula, sp. nov.

Primaries: ground colour pale ochreous suffused with gray, and rather evenly shaded with smoky brown; the most prominent feature is an oblique dash of the ground colour which extends from a point on outer margin just below costa inwards to the cell and is shaded superiorly with smoky brown, which shade extends more or less distinctly through the cell to the base of wing, leaving the cubital vein as a fine ochreous line distinct to the discocellular vein. In the ♂ two very faint dark dots are

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visible at the end of cell; fringes concolorous. Secondaries in the ♂ deep smoky with a pale line at the base of the dusky fringes; in ♀ slightly smoky with pale fringes, cut by a slightly darker line. Beneath primaries smoky, lighter outwardly; secondaries lighter, sprinkled with smoky brown. Expanse, ♂ 24 mm., ♀ 31 mm.

Habitat: ♂, Palmerlee, Ariz.; ♀, White Mts., Ariz.; 1 ♂, 1 ♀. Types, collection Barnes.

The species is closely related to *delicata*, but is in general much darker and lacks the strigate appearance of this species, due to the fact that the veins in the outer area of primaries are not visible; the dusky secondaries in both sexes first led us to separate it. The apical ochreous dash is also not direct from the apex of the wing but from a point on the outer margin below apex; the palpi are distinctly longer than in *delicata*.

Redingtonia, gen. nov.—(Type *R. alba*, sp. nov.)

Palpi short, upturned, third joint porrect; proboscis well developed, front with a pointed corneous prominence, its lower edge produced to a trilobate plate with corneous plate below it; head and thorax clothed with rough hair, intermingled with scales; anterior tibia unarmed; posterior tibiae clothed with long hair, without spines; primaries with broad cell, vein Cu_2 from well before lower angle, veins Cu_1 , M_3 and M_2 from around lower angle, M_1 from just below upper angle, areole present, veins R_3 and R_4 stalked, from apex of areole with R_5 , R_2 from areole, R_1 from middle of cell. Secondaries with M_2 obsolescent from below middle of discocellular, R and M_1 from apex of cell, M_3 and Cu_1 from lower angle.

The extraordinary frontal protuberance, which may be compared to that of *Azenia*, with an extra pointed prominence added dorsally, as well as the rough hairy squamation, sufficiently characterize this genus. It falls near *Azenia* Grt., according to Hampson's tables (Lep. Het., Vol. IX).

R. alba, sp. nov.

Front and abdomen pale ochreous. Head, thorax, and wings pure white, immaculate. Beneath primaries rather smoky, secondaries white. Expanse, 29 mm.

Habitat: Redington, Ariz., 2 ♀s. Type, collection Barnes.

Genus Homolagoa, gen. nov.—(Type *H. grotelliformis*, sp. nov.)

Palpi upturned, 3rd joint long, pointed, smoothly scaled; antennae ciliate, ocelli present; thorax clothed rather roughly with hair and scales; abdomen of ♀ with a thick tuft of hairs at extremity; tibiae unarmed,

front with a prominent wart-like conical tubercle and a slight infra-clypeal plate; primaries with well rounded outer margin, vein R_1 from middle of cell, R_2 from upper angle of areole, R_3 and R_4 on long stalk, from apex of areole with R_5 , M_1 from below upper angle of cell, M_2 and M_3 close together from above lower angle of cell, Cu_1 from lower angle, Cu_2 from beyond centre of cell. Secondaries with Sc. joined to cell at base, R and M_1 slightly stalked, M_2 curved downwards at base from well above lower angle of cell, M_3 and Cu_1 connate from lower angle, Cu_2 from beyond centre of cell.

The presence of a well developed vein M_2 on secondaries would place the genus in the family *Erastrinae* of Hampson. Apparently its position would be somewhere near *Exyra* Grt. The frontal structure and the abdominal tuft of the ♀, similar to that found in *Lagoa* and certain Liparid species, render the genus easily recognizable.

H. grotelliformis, sp. nov.

Palpi blackish; head, thorax and primaries white; abdomen white with the segmental divisions banded with black; maculation of primaries much as in certain *Grotella* species; a black dot on costa at base; a transverse subbasal band of three black dots, one on costa, one on inner margin and the middle one equidistant from both; a transverse median band of 5 black dots slightly curved inward at costa consisting of a dot on costa, two vertically placed dots at end of cell, a dot below vein 2 and another on inner margin; fringes white, slightly tipped with black in costal portion; secondaries smoky, paler basally, with faint trace of a dark antemedial line; fringes white. Beneath primaries dark smoky brown with white fringes, secondaries white with discal dot and dot about middle of costa. Expanse, 22 mm.

Habitat: Redington, Ariz; Palmerlee, Ariz., 1 ♂, 2 ♀s. Types, collection Barnes.

Tarache areloides, sp. nov.

Head, front and palpi dark purple-brown, tegulae, thorax and abdomen cream-coloured; primaries with basal third as far as inner margin of orbicular cream-coloured, remainder of wing deep purple-brown, shaded broadly at anal angle with lighter shades; basal line geminate, gray-green, extending half across wing; t. a. line geminate, gray-green, the lines broader at costa, angled inwardly in the cell, incurved on submedian fold; orbicular and reniform small, oval, outlined with black and filled with blue-black scales, the former usually entirely within the dark area of

wing, occasionally with the inner edge just projecting into the white area ; on the costa just beyond reniform a large white quadrate patch from the base of which the geminate t. p. line arises and bends sharply inward below reniform and orbicular, almost reaching the margin of the dark area of wing ; from a point below the orbicular it turns towards the inner margin, forming two lunulate marks, the upper being the larger ; the space beyond the t. p. line is almost entirely filled with bluish purple ; s. t. line indistinct, marked with creamy at costa and in central area, incurved at vein 2 ; a broken terminal dark purple-brown line ; fringes bluish purple, cut with white opposite cell and between veins 2 and 3. Secondaries whitish with narrow smoky border in ♂, almost entirely smoky in ♀ ; fringes pale. Beneath, primaries smoky with the white patch of upper side marked in ochreous. Secondaries suffused with pale smoky brown, with a discal spot and indistinct postmedian line angled sharply opposite the cell. Expanse, 27 mm.

Habitat : White Mts., Ariz., 3 ♂s, 5 ♀s. Types, collection Barnes.

Closely related to *areli* Stkr.; differs in the much larger size of the white patch and the fact that the orbicular is not contained within the light area of wing.

(To be continued.)

THE OLDEST AMERICAN HOMOPTEROUS INSECT.

BY T. D. A. COCKERELL. UNIVERSITY OF COLORADO.

With very few exceptions, the cretaceous strata of North America, so rich in various organic remains, have failed to yield insects. A cockroach from the Judith River Beds in Montana has been described as *Stantonella cretacea* (Handlirsch). A Protoblattoid from the Kootanie of Montana is called *Lygobius knowltoni* Mitchell. Beetle remains named *Archiorhynchus angusticollis* Heer, *Curculiopsis cretacea* (Heer), and *Elytrulum multipunctatum* (Heer), are from the lower cretaceous of Greenland, while one from the Pierre formation of Manitoba is named *Hylobiites cretaceus* Scudder. Egg-masses from the Laramie Beds of Colorado are called *Corydalites fecundus* Scudder. Considering the enormous time represented by the cretaceous, and the richness of the flora, it is certain that there must have existed a succession of insect-faunæ including innumerable types, almost all of which are now unknown to us. This is particularly unfortunate, because during this period the modern families of insects must have been in course of evolution. Tertiary insects we have in abundance, but they are not old enough to

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afford much clue to the history of living groups; early mesozoic fossils, so far as found in this country, represent the least specialized of modern orders. In other parts of the world, cretaceous insects are also extremely scarce; of Homoptera, excepting some very dubious gall-like objects on *Eucalyptus* leaves, there is only a single species, the cicadid *Hylæoneura lignei* Lamere and Severian, from Belgium. The first American cretaceous Homopteron has just been found by Mr. Terry Duce in the Pierre formation at Lesser's brickyard, Boulder, Colorado. There is no doubt about the formation, as the specimen is in the same piece of rock as the characteristic mollusc *Scaphites nodosus* Owen. The formation is marine, but it was evidently laid down close to land, and the insect doubtless fell or was washed into the sea.

Petropteron mirandum, n. g., n. sp.

A tegmen or upper wing, the part preserved $7\frac{1}{2}$ mm. long, the actual length probably about $9\frac{1}{2}$; width near the middle about $4\frac{1}{2}$; shape subtriangular, broadly widening apically; veins strong, reddish brown, membrane apparently strong, no markings of any kind; venation as shown in the figure, the interpretation given being scarcely open to doubt, with the possible exception of the first anal, which may be in

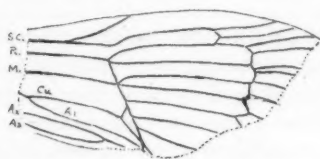


FIG. 4.—*Petropteron mirandum*, n. sp.

reality the inferior branch of the cubitus; there is no sign of a free first anal. There are two series of gradate veins, the inner placed somewhat as in *Dicranotropis*, the outer much as in the eocene genus *Eofulgorella*, and many living forms. The closed anal cell is normal for many Homoptera, and is exactly as in the European cretaceous *Hylæoneura*. The lower branch of the subcosta, although bulging in the direction of the radius near the beginning of the first series of gradate veins, is not connected with it by any cross-vein at this point. The triangular cell in the branches of the cubitus, contiguous with the first gradate series, finds a parallel in Kirkaldy's "restored" figure of *Ancono*. The basal union of cubitus and first anal is as in *Scolypopa*.

I suppose the insect to be a Fulgorid, and this possibility is supported by the occurrence of Fulgoridæ in the older Purbeck Beds of

England. It is quite possible, however, that it belongs to an extinct family.

The name *Petropteron* is in allusion to the Pierre formation.

P. S.—On renewed minute examination, I feel sure I see traces of the end of a free first anal. There seems to be a longitudinal fold or distortion which makes it impossible to follow it any distance toward the base.

BOOK NOTICE.

CONTRIBUTIONS TO THE NATURAL HISTORY OF THE LEPIDOPTERA OF NORTH AMERICA, by Dr. William Barnes and Dr. J. H. McDunnough, Decatur, Ill.

Under the above title have appeared the first two parts of a new and much needed work on the Lepidoptera of North America which will meet with the heartiest commendations from all corners of the continent.

Prior to the publication by Dr. Holland of "The Butterfly Book" and "The Moth Book," there were but few entomologists who could afford to possess, or were fortunate enough to have access to, the rare and expensive separate works and long sets of volumes of periodicals in which to look for figures and descriptions. These two books, and particularly the plates, for the text is of necessity very limited, have proved of the greatest help to beginners and the more advanced as well, and many of us ventured to hope that the time might soon come when a reliable figure of every known North American species would be available. Now after a wait of eight years, our expectations begin to be realized, as the "Contributions" are exactly what we most needed, namely, a series of monographic reviews of families or smaller groups, giving descriptions of all the species, references to the more important literature, placing the generic names on a more stable basis, and last, but not least, photographic figures of each and every species.

Part I deals with "The Cossidæ of North America" and consists of 35 pages of text and seven plates (three of structure and four of imagos) and an index. Part II is entitled "The Lasiocampid Genus *Gloveria* and Its Allies"—17 pages of text, one plate of venation and three plates of imagos and an index, and covers a little wider range of territory, species from Mexico and Central America being included.

The size of page conforms with Dr. Holland's books, the text is well printed on excellent paper and the illustrations are all on plate paper. Much care has evidently been taken to secure accurate reproductions and

in many cases the actual types are shown. We quote the authors' remarks from the introductory chapter of Part I: "Owing to the relative rarity of many of the smaller species from the south and south-west, very few of our North American species have ever been figured. It has therefore seemed advisable to us to illustrate as fully as possible. In many instances we have been enabled to present a figure of the type specimen; in all other cases the specimen used for figuring purposes has been compared with the type either by ourselves or some competent authority." Some of the types referred to are in rather dilapidated condition and it is well that they have been photographed so that their appearance may be retained in a more permanent manner and it is to be hoped that the under surface has also been preserved photographically, although no under sides are shown in any of the figures. Probably this is because, in these groups, the markings of the under side are not of much value in differentiating between species.

While we have nothing but praise for this work, it is our duty to mention the slight and almost inevitable typographical errors, which have caught our eye. In Part I, page 33, lines 12 and 8 from foot of page, the genus *Prionoxystus* is spelled without the second o.; and also on line 12 from foot for *robina* read *robinia*.

In Part II, in the explanation of Plates II and IV, the word *forma* is printed in italics, making it appear to be part of the specific names, while the text indicates that they are aberrations.

We hope that these parts will shortly be followed by many others dealing with groups badly in need of elucidation. The price of Part I is \$1.50 and of Part II \$1.00, and they are obtainable from the authors.

Since writing the above, Part III has come to hand, entitled "Revision of the Megathymidæ," 43 pages. Price, \$1.25.

There has been much confusion in identification of the species of these "giant skippers," and also concerning the two sexes of several species, as well as through publication of wrong figures—and the seven half-tone plates of the butterflies, and of their structure, combined with the carefully-prepared text, should enable anyone to correctly identify the specimens they may be fortunate enough to acquire.

Other parts to follow in the near future will deal with "A List of Types in the Barnes' Collection," "Illustrations of Typical and Rare Specimens," and "Fifty New Species, Fully Illustrated."

A. F. WINN.

Mailed March 9th, 1912.

